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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/809,966

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Christoph Brabec

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04/12/2006

SCHIFF HARDIN LLP

Patent Department

6600 Sears Tower

233 South Wacker Drive

Chicago, IL 60606

EXAMINER

ZETTL, MARY E

ART UNIT

PAPER NUMBER

2875

DATE MAILED: 04/12/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

**Office Action Summary**

Application No.

10/809,966

Applicant(s)

BRABEC ET AL. 

Examiner

Mary Zettl

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☐ Responsive to communication(s) filed on 16 February 2006.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-11 and 13-25 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-11, 13 and 15-25 is/are rejected.
- 7) ☒ Claim(s) 14 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 16 February 2006 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some \* c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date \_\_\_\_\_
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_\_

**DETAILED ACTION**

***Response to Amendment***

1. The amendment filed on February 16, 2006 has been entered.

***Claim Objections***

2. Claim 17 is objected to under 37 CFR 1.75 as being a substantial duplicate of claim 16. When two claims in an application are duplicates or else are so close in content that they both cover the same thing, despite a slight difference in wording, it is proper after allowing one claim to object to the other as being a substantial duplicate of the allowed claim. See MPEP § 706.03(k).

***Claim Rejections - 35 USC § 102***

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

3. Claims 1, 2, 11, 13, and 21-25 are rejected under 35 U.S.C. 102(b) as being anticipated by Antonuk et al. (US 5,262,649 A).

Regarding claims 1 and 11, Antonuk et al. teach device for measuring ionizing radiation dosage (Abstract) comprising: a foil-like carrier comprised of a material selected from the group consisting of plastic or glass (Figure 1, item 12;

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col. 7, line 65); and a ionzing radiation absorption structure disposed on the foil-like carrier, the absorption structure comprising a plurality of thin-film layers disposed one above another, said layers comprising a layer embodying scintillator material (Figure 1, item 44) and a layer forming at least one thin-film diode structure (Figure 1, item 30) that supplies an output signal dependent on the ionizing radiation incident on the absorption structure (col. 6, lines 63-68).

Regarding claim 2, Antonuk et al. further teach the diode structure comoprising two film electrodes (Figure 1, items 38 and 22) and a photo-active semiconductor film layer (Figure 1, item 34) disposed between the two film electrodes.

Regarding claim 13, Antonuk et al. further teach the diode structure comprised of two film electrodes (Figure 1, items 38 and 22) and a photo-active semiconductor film layer (Figure 1, item 34) disposed between the two film electrodes, and wherein the scintillator is applied to one of the film electrodes as a thin-film scintillator layer (Figure 1, item 44).

Regarding claims 21 and 22, Antonuk et al. further teaches a plurality of absorption structures distributed in a matrix-like arrangement on a foil-like carrier (forming an array; col. 9, lines 60-64).

Regarding claims 23 and 24, Antonuk et al. further teach the foil-like carrier, the absorption structure, and the solid-state radiation detector forming a unitary component (Figure 1; col. 6, lines 47-58).

Regarding claim 25, Antonuk et al. teach a radiation image acquisition apparatus (Abstract) comprising: a radiation source that emits ionizing radiation

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(col. 6, lines 44-45); a radiation detector disposed in a path of the ionizing radiation (col. 6, lines 55-56); a device disposed in the ionizing radiation for measuring a dose of the ionizing radiation (Abstract), comprising a foil-like carrier (Figure 1, item 12), and a ionizing radiation absorption structure disposed on the foil-like carrier, the absorption structure comprising a plurality of thin-film layers disposed one above another, the layers comprising a layer embodying scintillator material (Figure 1, item 44) and a layer forming at least one thin-film diode structure (Figure 1, item 30) that supplies an output signal dependent on the ionizing radiation incident on the absorption structure.

***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. Claims 3-6, 8-10, 16, 18, and 19 are rejected under 35 U.S.C. 103(a) as being unpatentable over Antonuk et al. (US 5,262,649 A) as applied to claim 1 above, and further in view of Forrest et al. (US 6,198,091 B1).

Regarding claims 3 and 9, Antonuk et al. do not disclose expressly an organic semiconductor. Forrest et al. disclose an organic photosensitive device (Abstract), wherein the organic semiconductor material is selected from a group consisting of semiconducting conjugate polymers, derivative of semiconducting

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conjugate polymers, low molecular weight semiconductors, and plastics selected from the group consisting of monomers, oligomers, and polymers (col. 4, lines 27-29). At the time the invention was made, it would have been obvious to one of ordinary skill in the art to modify the invention of Antonuk et al. such that it comprised at least one organic semiconductor as taught by Forrest et al. One would have been motivated to make this modification so that the manufacturing process was simplified and the layers produced were thin and thus reduced signal error due to noise.

Regarding claims 4 and 5, Antonuk et al. further teach a layer functioning as a donor (Figure 1, item 32) and an additional material functioning as an acceptor (Figure 1, item 36) forming a heterojunction diode structure.

Regarding claim 6, Antonuk et al. further teach the semiconductor film layer being formed by a first sub layer (n-doped layer; Figure 1, item 32) comprised of a first of two different semiconductors, and a second sub-layer (p-doped layer; Figure 1, item 36) comprised of a second of two different semiconductors, the first and second sub-layers forming a heterojunction.

Regarding claim 8, Antonuk et al. further teach the photoactive semiconductor film layer comprised of a p-doped first sub-layer (Figure 1, item 36) and an n-doped second sub-layer (Figure 1, item 32), forming a pn-junction.

Regarding claim 10, Forrest et al. further teach at least one of the thin film electrodes comprising a material selected from the group consisting of conductive polymers, doped polymers, metals, metal alloys, metal oxides and alloy oxides (col. 20, lines 26-27). At the time the invention was made it would

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have been obvious to one of ordinary skill in the art to modify the invention of Anutonuk et al. such that the thin film electrodes were comprised of a material from the group listed above as taught by Forrest as these materials were well known for having desirable electrode characteristics.

Regarding claim 16, Forrest et al. further teach the photoactive semiconductor film layer having a thickness less than or equal to  $1\text{ }\mu\text{m}$  (300-1,000 Angstrom; col. 18, line 52). At the time the invention was made, it would have been obvious to one of ordinary skill in the art to modify the invention of Anutonuk et al. such that the thickness of the semiconductor film layer was reduced to the thickness taught by Forrest et al. such that the amount of radiation absorbed was limited and the amount of noise generated was reduced.

Regarding claims 18 and 19, Forrest et al. further teach a diode structure (Figure 6) comprising two film electrodes and a photo-active semiconductor film layer disposed between the two film electrodes, and wherein at least one of the film electrodes has a thickness of less than or equal to  $1\text{ }\mu\text{m}$  (1,000-4,000 Angstrom; col. 18, line 33). At the time the invention was made it would have been obvious to one skilled in the art to modify the invention of Anutonuk et al. such that components were made as thin as possible such that the amount of radiation absorbed was limited and the amount of noise generated was reduced, and in particular to have made the modification such that the thickness of the film electrodes was less than or equal to  $1\text{ }\mu\text{m}$  as suggested by Forrest et al.

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5. Claim 20 is rejected under 35 U.S.C. 103(a) as being unpatentable over Antonuk et al. (US 5,262,649 A) as applied to claim 1 above, and further in view of Maier (US 4,661,168 A).

Regarding claim 20, Anutonuk et al. do not disclose expressly the application technique for the plurality of layers. It would be obvious to one of skill in the art that thermal vaporizations, cathode sputtering, solution centrifuging, and printing are common methods for applying layers in semiconductors. Maier et al. teach applying layers to a semiconductor by thermal vaporizations or cathode sputtering (col. 5, lines 36-51). At the time the invention was made it would be obvious to one skilled in the art that the means for layer application would consist of a technique selected from thermal vaporizations, cathode sputtering, solution centrifuging, and printing, as suggested by Maier et al., since these techniques are the common methods of application for the art.

6. Claims 7 and 15 are rejected under 35 U.S.C. 103(a) as being unpatentable over Antonuk et al. (US 5,262,649 A) and Forrest et al. (US 6,198,091 B1) as applied to claims 5 and 1 above, and further in view of Afzali-Ardakani et al. (US 2004/0183070 A1).

Regarding claims 7 and 15, Anutonuk et al. do not disclose expressly the semiconductor film layer comprising a mixture of different semiconductors such that a plurality of heterojunctions are formed. Afzali-Ardakani et al. teach the use of a mixture of semiconductors to form solid state heterojunctions for use in



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various electronic systems. At the time the invention was made, it would have been obvious to have modified the invention of Anutonuk et al. such that a semiconductor film layer comprising a mixture of different semiconductors forming a plurality of heterojunctions was used in place of having separate semiconductor layers such that the thickness of the heterojunction section was reduced which would have resulted in reduced noise.

### ***Allowable Subject Matter***

7. Claim 14 is objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

The following is a statement of reasons for the indication of allowable subject matter: Prior art fails to teach or make obvious a device for measuring an ionizing radiation dosage comprising a scintillator integrated into a film electrode.

### ***Response to Arguments***

8. Applicant's arguments with respect to claims 1-11, 13-19, and 21-24 have been considered but are moot in view of the new ground(s) of rejection.

### ***Conclusion***

9. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Mary Zettl whose telephone number is (571) 272-6007. The examiner can normally be reached on M-F 8am-4:30pm.


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If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Renee Luebke can be reached on (571) 272-2009. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

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RENEE LUEBKE  
PRIMARY EXAMINER